Trends and Gender Differences in Substance Use Among Children and Adolescents Admitted to an Addiction Treatment Center in Turkey: Years 2011-2013

Canan Tanidir¹, Arzu Demirci Ciftci², Neslim Guvendeger Doksat³, Hatice Gunes¹, Hamiyet Ipek Toz¹, Ayten Erdogan¹,⁴

ABSTRACT:
Trends and gender differences in substance use among children and adolescents admitted to an addiction treatment center in Turkey: years 2011-2013

Objective: In this study we aimed to examine the trends and gender differences in substance use behaviors and treatment seeking patterns of children and adolescents who were admitted to an addiction treatment center in Turkey.

Method: Participants were 2718 children and adolescents who had been consecutively admitted to the ‘Children and Adolescent Alcohol and Drug Dependency Treatment Center’ in Istanbul between January 2011 and December 2013. A detailed drug use questionnaire was completed by all participants, and substance use characteristics were analyzed in terms of gender and substance types. The data regarding age of first use, age at referral, referral pattern, and type of the substances used were compared between three years (2011, 2012, and 2013) and between genders.

Results: There was a statistically significant increase in the number of females (p<0.001) and in the total number of children and adolescents (p<0.001) seeking treatment for substance use through these years. The mean age of first use was 13.8 years (SD: 2.1) and the mean age at referral for treatment was 16.1 years (SD: 1.5) in the whole group. The mean age at referral for treatment was significantly lower in the female group (p<0.001). There was a statistically significant increase in the proportion of subjects admitted to the addiction treatment center alone or with their family (p<0.001) and in the number of subjects brought in by social services (p<0.001), while there was a statistically significant decrease in the number of non-voluntary referrals from forensic services through the years (p<0.001). There was a statistically significant increase in the rate of ecstasy, heroin, synthetic cannabinoid use and polysubstance use and a statistically significant decrease in the age of first use (p<0.0001) and inhalant/solvent use through the years. Use of solvents/inhalants was more common among men (p<0.001), whereas ecstasy and cocaine use was more common among women (for each, p<0.001). Polysubstance use was present in 60.2% of the subjects, and there was a statistically significant increase in the mean number of substance types used in the last two years (p<0.001).

Conclusion: As different and new illicit drugs rise and fall in popularity, it is important to re-examine the patterns of substance use and to re-organize the prevention policies and treatment strategies. Considering the decrease in the age of first use and the increase in the number of youth using multiple drugs and/or hard drugs, new and more effective preventive strategies should be developed targeting children and adolescents in Turkey.

Keywords: children, adolescent, drug, addiction, gender, trend

INTRODUCTION

The extent of substance use (SU) has been increasing over the past few years in Europe, and several studies show that SU has made inroads into younger ages and early adolescence¹,². While there is some evidence that drinking and binge drinking rates have declined in the last years in most countries, the use of marijuana and some other illicit drugs have increased during this period.³
Although lower rates of SU had been reported in Turkey compared to European countries and the U.S., the frequency of SU has significantly increased through the years4,5. The European School Survey Project (ESPAD) and Youth in Europe (YIE) are the most important studies monitoring SU trends among high school students within European countries. A significant increase in illicit drug use was observed among Turkish youth in these studies4,6.

SU by young people has been proven to be a rapidly changing phenomenon, requiring frequent assessments and reassessments. In order to develop effective national policies and interventions for substance-using youth, it is important to identify new SU trends in this population. Also, predicting change is extremely important for integrating or developing new strategies for prevention, screening and treatment programs which largely depend on the ongoing collection of valid and reliable data. However, there is a limited number of studies that evaluate the changes and trends in SU in Turkish children and youths5,7. Studies with high-risk populations (children and adolescents admitted for SU treatment) may be more valuable for these purposes, as they may better characterize substance users and their patterns of use compared to national drug survey studies. There is only one study from Turkey, conducted in Izmir with a limited number of participants, that has evaluated the changes in SU patterns in children and adolescents who were admitted for SU treatment between the years 2003 and 20075,8.

There are very few addiction treatment centers for children and adolescents in Turkey, one of the biggest being a center in Istanbul named ‘CAADDTC’ (Children and Adolescent Alcohol and Drug Dependency Treatment Center). In this present study, we aimed to examine the trends and gender differences in substance use behaviors and treatment seeking patterns of children and youth who were admitted to CAADDTC Istanbul, Turkey between the years 2011 and 2013.

**METHOD**

The participants were 2718 children and adolescents who had been admitted to the CAADDTC at Bakirkoy Research and Training Hospital for Psychiatric and Neurologic disorders in Istanbul between January 2011 and December 2013. At admission, the ‘World Health Organization (WHO) students’ drug use questionnaire’ was completed by the psychiatrists for all patients. The WHO students’ drug use questionnaire has been validated by Adelekan and Odejide and was re-arranged content wise with some minor modifications in terms of simplicity and convenience9. The questionnaire has three sections. The first section relates to socio-demographic items, the second section assesses the pattern of SU. The substances of enquiry include tobacco, alcohol, cannabis, synthetic cannabinoids, opiates, cocaine, psycho-stimulants, hallucinogens, organic solvents/inhalants, prescription medicines, and hypnosedatives. For each class of substances, there are four sub-sections to elicit current and lifetime use, frequency of use and age of first use. The third section consists of items relating to SU among the patient’s friends and family members and the patient’s knowledge about the harmful effects of SU.

SU characteristics were analyzed in terms of gender and substance types. The data regarding age of first use, age at referral, referral pattern and types of the substances used were compared among the three years (2011, 2012, and 2013) and between genders.

**Statistical Analysis**

Descriptive statistics were computed as mean±SD, count and percent of frequency in tables and graphs. The Pearson chi-square test was used to compare categorical variables between years, and variance analysis was used for comparing numerical variables between years. The p-value of <men 0.05 was accepted as statistically significant. Data analysis was performed using PASW version 18.0 statistical software (SPSS Inc., Chicago, IL).
RESULTS

General Data

Between the dates of January 2011 and December 2013, a total of 2718 children and adolescents were admitted to the CAADDTC outpatient clinic. There was an increase in the total number of children and adolescents seeking treatment through the years (p<0.001). For all three years, the number of men referred to the addiction treatment center was higher than that of women. But the number of females referred to CAADDTC significantly increased in the last two years compared to the year 2011 (p<0.001). Most of the participants 72.9% were from Istanbul, and the remainder were from other cities in Turkey; 59.1% were living with their parents; 2.8% of the parents and 19.2% of second degree relatives had a history of substance use. The distribution of participants according to referral year and gender is shown in Table 1.

Referral Patterns of the Subjects

Most of the subjects (73.9%) had come to the treatment center with their parents. There was a statistically significant increase in the proportion of patients admitted to the addiction treatment center alone and with their family (p<0.001). In the whole sample, 5.7% of the subjects were brought in by social services, and there was a statistically significant increase in the number of referrals from social services through the years (p<0.001). In total, 7.7% of the subjects were brought in by forensic services, and there was a statistically significant decrease in the number of involuntary referrals from forensic services through the years (p<0.001). The referral pattern of the participants is shown in Table 2.

Age of First use and Time Until Referral

The mean age of first use was 13.8 years (SD:2.1, range: 6–20 years) in the whole group. There was no statistically significant difference between male and female participants regarding the mean age of first use (p=0.97). There was a statistically significant decrease in the mean age of first use in the last two years (p<0.001). The mean age at referral for treatment was significantly lower in 2012 compared to 2011 and 2013 (p<0.001). Mean age of first use and mean age at referral according to years are shown in Table 3.

There was a mean duration of 2.3±1.9 years between initiating drug use and referral for treatment. This duration was 1.7±1.5 years for the female group and 2.4±1.9 years for the male group, which was statistically different (p=0.001).

Table 1: Distribution of study participants according to referral year and gender

<table>
<thead>
<tr>
<th>Gender</th>
<th>Total 2011</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>n (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2205 (81.1)</td>
<td>754 (87.2)*</td>
<td>547 (78.4)</td>
</tr>
<tr>
<td>Female</td>
<td>n (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>513 (18.9)</td>
<td>111 (12.8)</td>
<td>151 (21.6)*</td>
</tr>
<tr>
<td>Total</td>
<td>n</td>
<td>2718</td>
<td>865</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p<0.001

Table 2: Referral Pattern of the study participants

<table>
<thead>
<tr>
<th>Referral Pattern</th>
<th>Total</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brought in by family members</td>
<td>73.9</td>
<td>68.8</td>
<td>72.8*</td>
<td>78.3*</td>
</tr>
<tr>
<td>Brought in by social services</td>
<td>5.7</td>
<td>4.1</td>
<td>5.8*</td>
<td>6.9*</td>
</tr>
<tr>
<td>Brought in by forensic services</td>
<td>7.7</td>
<td>13.9</td>
<td>10.0*</td>
<td>1.6*</td>
</tr>
<tr>
<td>Admitted on their own</td>
<td>4.1</td>
<td>2.0</td>
<td>4.6*</td>
<td>5.5*</td>
</tr>
<tr>
<td>Other</td>
<td>8.6</td>
<td>11.2</td>
<td>6.8</td>
<td>7.7</td>
</tr>
</tbody>
</table>

The values are expressed in percent (%). *p<0.001
The mean age at referral for treatment was significantly lower in the female group (p<0.001).

**Substance Types and Pattern of Substance use**

In the whole group, the most commonly used substances for the whole group were cannabinoids (73.9%), inhalants/solvents (52.7%), ecstasy (47.5%), and synthetic cannabinoids (41.9%), respectively. The prevalence of alcohol, cannabis and cocaine use was significantly higher in 2012 (p<0.001, p=0.003, p=0.001, respectively). There was a statistically significant increase in the prevalence of ecstasy, heroin, and synthetic cannabinoid use in the last two years (p<0.001, p=0.001, p<0.001, respectively). There was a statistically significant decrease in the prevalence of prescribed drugs and cocaine use in 2013 (p=0.05, p=0.001, respectively). There was a statistically significant decline in the prevalence of solvent/inhalant use and unclassified drug use through the years (p<0.0001, p<0.001, respectively). The prevalence of use for each substance type according to years and genders is shown in Figures 1 and 2.

Polysubstance use was present in 60.2% of the subjects. The mean number of substance types used was 2.5±1.4 in the year 2011, 3.5±1.9 in the year 2012, and 3.2±1.8 in the year 2013. There was a statistically significant increase in the mean number of substance types used in the last two years compared to the year 2011 (p<0.001). There was no statistically significant difference between male and female participants regarding polysubstance use (p=0.98).

Age of first use was significantly different between substance types (p<0.001) being 13.2 years for alcohol and 14.2 years for heroin and cocaine. Alcohol and cannabis were first used at a significantly younger age than the ‘hard drugs’ (for all, p<0.05). Inhalants were also used at a younger age than most of the other substances including ecstasy (p<0.001), cocaine (p<0.001), heroin (p=0.001), and benzodiazepines (p=0.002).
Gender Differences in Substance use Patterns

Use of solvents/inhalants was more common among male participants (males: 51.0%; females: 34.1%; p<0.001), whereas ecstasy (males 38.9%; females 57.8%; p<0.001) and cocaine use was more common among female participants (males 5.6%; females 11.5%; p<0.001). There was a gradual decline through the years in the inhalant/solvent use among males (p<0.0001). The prevalence of alcohol use among males was significantly higher in 2012 compared to 2011 and 2013 (p<0.001). The prevalence of alcohol use among females was significantly lower in 2013 compared to the previous two years (p=0.017). There was a statistically significant increase in ecstasy use among males in the last two years compared to 2011 (p<0.0001). The prevalence of cannabis use among both males and females was significantly higher in the year 2012 (p=0.05, p=0.013, respectively). There was a marked gradual rise through the years in synthetic cannabinoid use both for males and females (for each group, p<0.001). There was a statistically significant decrease in the prevalence of prescribed drug use among males in 2013 (p=0.05). A statistically significant increase in the frequency of heroin use was seen in males in 2012 and 2013 compared to 2011 (p<0.001). There was a statistically significant decrease in the prevalence of cocaine use in 2013 compared to 2012 for both males and females (for each, p=0.005). There was a statistically significant gradual decline in the prevalence of unclassified drug use through the years both for males and females (p<0.001, p=0.05, respectively).

DISCUSSION

Since there are very few addiction treatment centers for children and adolescents in Turkey, this study is important for examining the changes and gender differences in SU and treatment seeking patterns of a large number of children and youths during the most recent years. One of the main findings of this study was that there was an increase in the number of females and in the total number of children and adolescents seeking treatment over time. In addition, there were marked changes in the SU pattern and in the types of substances used. There was an increase in the prevalence of ecstasy, heroin, synthetic cannabinoid use and polysubstance use and a significant decrease in the age of first use through years.

The results are discussed in detail and compared with the results of previous studies in the following sections.

Changes in the Number of Participants Referred for Treatment and Gender Distribution

There was an increase in the number of adolescents admitted to treatment in the year 2013. This may indicate an increase in the number of adolescents using substances or an increase in the number of help-seeking adolescents who want to quit using illicit drugs.

Compared with previous studies from Turkey, the most likely reason for this change seems to be the increase in the number of youths using illicit drugs. Similar trend studies from the USA, such as “Monitoring the Future (MTF)”, have reported that since 2008 illicit drug use has been increasing among secondary school students10. Molinaro et al. (2011) studied trends of SU among Italian high school students over 11 years (1999-2009) and found that during the 10-year period, alongside a steady decline in cannabis use, hallucinogen and stimulant use increased markedly11.

In the present study, most of the patients attending CAADTC were males in all three years; however, there was a significant increase in the number of females in the last two years. This may indicate an increase in the number of females using substances or an increase in the number females seeking treatment for SU. The increase in the number of females abusing alcohol or drugs is important in that it also means an increase in the number of unsafe sexual practices and unintended pregnancies12.

It is difficult to ascertain whether female substance users in Turkey are less likely to seek treatment than male users, since there is limited
data about the gender distribution of treatment-seeking in Turkey. Similarly, a previous study from Turkey which examined the SU trends in adolescents referred for treatment between years 2003 and 2007 reported an increase in the number of referred female subjects through the years. In addition, similar to our findings, studies from other developing countries have also reported a male predominance in treatment-seeking youths. However, some studies have reported similar rates between genders of individuals seeking treatment for substance use. The low female/male ratio in our sample may be attributed to the poor health-seeking behavior among females, which had been reported in previous studies, or to the feeling of embarrassment and shame they might face in revealing this behavior to their families and society. However, the female group attended to treatment earlier than the male group in our study sample. One explanation for this difference may be that females are more sensitive to the adverse effects of illicit drugs and seek treatment earlier to get rid of the health problems caused by substance use. Secondly, it may be related to a cultural issue, as in Turkey girls are more closely supervised by their parents compared to males, so parents may find out earlier about their daughters’ substance use and seek treatment earlier.

**Changes in the Referral Pattern**

While the proportion of subjects referred to the addiction treatment center by forensic services was significantly higher in 2011, in the last two years the proportion of subjects presenting to the treatment center voluntarily alone or with their families and social services increased. One explanation for this trend may be that more families, social services, or educational services knew about the existence of an addiction treatment center via the media and intervention strategies and referred the youths at risk for treatment. In addition, media coverage of harmful effects of illicit substances has grown in recent years in Turkey because of the increase in the number of deaths and hospitalizations of adolescents after synthetic cannabinoid use. Another explanation is that more adolescents became aware of the harmful effects of the illicit drugs and tried to seek help. Also, since the rate of poly-drug and hard drug use increased through the years, this pattern may have affected the functionality of youths more negatively, leading more families to be aware of their children’s substance use and to seek treatment.

**Age of First use and Age at Referral**

The decreasing age of first use through the years is one of the main findings of this study. This finding was consistent with other studies from the U.S. and European countries. In Turkey, the marketing of certain illicit drugs (especially synthetic cannabinoids) has increased in recent years, and children and adolescents seem to gain access to illicit drugs more easily compared to previous years. This finding is very important in that, while exploratory substance use during puberty may be considered as normal to a certain extent, many studies showed that substance use at a young age is associated with chronic use and dependence with more adverse impacts on other life domains. Considering the decrease in the age of first use, new and more effective preventive strategies should be developed targeting younger children in Turkey. The mean age at treatment seeking behavior found in the present study was compatible with two similar studies from Turkey.

**Changes in The Types of Substances used**

One of the most important findings of this study was the increase in the prevalence of synthetic cannabinoids, ecstasy, heroin use and polysubstance use. In the whole group, the most commonly used substances were cannabis, inhalants, ecstasy, and synthetic cannabinoids, respectively. A similar study from Turkey including 323 adolescents referred to an addiction treatment center reported cannabis, inhalants, and ecstasy as the most
common substances used\(^3\). Our findings were also consistent with the findings of MTF studies from the U.S. and the report of the United Nations Office on Drugs and Crime which refers to cannabis as the most widely abused drug on a global scale\(^4\). In the present study, the prevalence of cannabis use was significantly higher in 2012 compared to 2011 and 2013 (\(p=0.001\)). Richter et al. (2012) analyzed 11,917 students for prevalence and trends in alcohol and cannabis use in Germany and found a decrease in the prevalence of cannabis use between the years 2002 and 2010\(^20\). In another study from Italy including high school students, there was a steady decline in the prevalence of cannabis use (1999-2009)\(^11\).

There was a statistically significant increase in the prevalence of synthetic cannabinoid use in the last two years. Synthetic cannabinoids seem to have replaced cannabis in recent years in Turkey. Due to low cost, easy accessibility, and detection difficulties in labs, the marketing of synthetic cannabinoids markedly increased in Turkey. Until March 2011, these drugs were not listed by the Turkish Drug Enforcement Administration, so they were readily and legally available on the internet and from street vendors etc. Easy availability of these drugs may be giving an impression to adolescents that they are safe to use. In the MTF study, it was shown that there was quite a low level of perceived risk for experimental use among high school students. In contrast to our finding, its use declined by 1.6 percentage points from 2011 to 2013 in U.S. high school students\(^3\).

Solvents/inhalants were the second most commonly used substance group in our study; however, the use of inhalants/solvents has been decreasing according to our study and a previous study from Turkey\(^8\). The recent decrease seen in the use of inhalants/solvents may be due to the marketing of new and cheaper illicit drugs like synthetic cannabinoids since 2011 in Turkey. In addition, increased information about the adverse effects of inhalant use via popular media and effective national policies and interventions regarding inhalant-using youths in the past may also have had an effect on the decline. Consistent with the present study findings, trend patterns from the U.S. showed that the use of inhalants reached a low point by 2002 or 2003 and then increased in some high school students, but then a gradual decline has been seen from 2011 to recent years\(^3\).

There was a statistically significant increase in the prevalence of ecstasy use in the last two years according to the present study. In the MTF study, it was found that since 2005 there has been a significant increase in ecstasy use among high school students from 2010 to 2012, but in 2013 the annual prevalence was found to be unchanged\(^3\). Similarly, results of a trend study from Istanbul showed that lifetime ecstasy use in secondary school students increased from 2.65% to 3.31% between the years 1998 (11,911 students) and 2001 (18,556 students)\(^7\). Recent studies showed that ecstasy seems to be perceived among adolescents as involving a lower risk than other hard drugs. However, the initiation of ecstasy use may lead youths to become exposed to a polysubstance culture, where the availability of other hard drugs is greater and the use of such drugs is socially accepted and normalized\(^21\).

Alcohol was one of the most widely used substances by Brazilian and American adolescents in studies of national drug use surveys and treatment seeking adolescents\(^16,22\). In contrast to the Western literature, alcohol was not one of the most commonly used substances in our study. This may be a result of the religious characteristics of people in Turkey, most of whom are Muslims and for whom alcohol drinking is strictly forbidden. Secondly, the participants of this study were recruited from an addiction treatment center, so it is possible that although more adolescents in the general population use alcohol, the duration of alcohol consumption may not have reached addiction levels prompting families to look for help. In the present study, alcohol use was highest in 2012, but there was a decline in 2013 to rates similar to those found in 2011. Unlu and Evcin reported an increase in alcohol consumption in the Bağcılar region of Istanbul based on their study including 2627 high school students\(^23\). Most recent time-trend studies in
European countries and the U.S. have shown decreasing rates of adolescent alcohol use.\textsuperscript{3,17,20}

Looking at the trends in heroin use, we found an increase in prevalence through the years. In contrast with our findings, there was a decline in heroin use in the USA between 1999 and 2013\textsuperscript{3}. In addition, another trend study from Italy including high school students showed a consistent decrease in the prevalence of heroin use between 2005 and 2009\textsuperscript{11}.

There was a statistically significant decrease in the prevalence of cocaine use in 2013 compared to 2012. Similarly, in MTF studies, cocaine use rose among high school students from 1994 to 2004, but showed a decline from 2008 to 2013. A trend study with Italian high school students found that from 2005 to 2008 the prevalence of cocaine use remained stable\textsuperscript{11}.

### Gender Differences in Substance use Patterns

In the present study, the use of solvents/inhalants was more common among males, whereas ecstasy and cocaine use were more common among females. In contrast to our findings, in a study including Italian high school students, Molinaro et al. reported that stimulant and cocaine use was more common among males\textsuperscript{11}. However, Molinaro et al. also reported that the use of solvents/inhalants was more common among males, which was similar to our results. Higher prevalence of solvents/inhalant use among males may be related to the fact that its use in Turkey is associated with lower income and street culture.

In Turkey, girls tend to be more closely supervised by their parents, which may cause difficulty in reaching illicit drugs with the exception of parties, where they could easily find ecstasy and stimulants commonly known as party/club drugs.\textsuperscript{24} In places like clubs, ecstasy is commonly used as a party drug, being readily available, and expensive drugs like cocaine are provided to young girls by rich boys or men who want to abuse girls sexually. This may have influenced the higher prevalence of ecstasy and cocaine use among females found in this study. In addition, females are possibly more discerning and controlled compared to males in substance type selection.

### CONCLUSION

The present study showed that there were marked changes in the types of substances used and referral pattern of youths being admitted for substance use treatment. There was an increase in the total number of adolescents and females referred for substance use treatment and an increase in the use of polysubstances, hard drugs, and synthetic cannabinoids through the years. As different and new illicit drugs rise and fall in popularity, it is important to re-examine patterns of substance use and to reorganize prevention policies and treatment strategies. Considering the decrease in the age of first use and the increase in the number of youths using polysubstances or hard drugs, new and more effective preventive strategies should be developed targeting children and adolescents in Turkey.

### Limitations and Strengths

The strength of our study is the large sample size from a high-risk population (children and adolescents admitted for substance use treatment), which may better characterize substance users and their patterns of use compared to national drug survey studies. However, there are some limitations regarding this study that should be taken into account. The most important limitation was the possible selection bias that may have inflated the level of polysubstance and hard drug use, as our clinic is one of the biggest addiction treatment centers for adolescents in Turkey, which also has an inpatient unit. In addition, most of our patients come from low-income and less educated families, possibly constituting a more severe group, with a greater number of psychiatric disorders and socio-emotional problems compared to population-based and other clinical samples. Second, the study sample may not be totally representative for all substance-using adolescents in Turkey, particularly due to the
existence of youths who did not attend substance treatment services and due to the fact that data were limited to one major city of the country. However, Istanbul is a city which has a high immigration rate from other parts of the country, and many children and adolescents from other cities of Turkey are referred to this special center for substance use treatment where the present study was conducted.

References:


